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CD-ROM PUBLICATION OF THE MARS DIGITAL CARTOGRAPHIC DATA BASE

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The recently completed Mars mosaicked digital image model (MDIM; Batson and Edwards, 1990) and the soon-to-be-completed Mars digital terrain model (DTM; Wu, et al., 1990) are being transcribed to optical disks to simplify distribution to planetary investigators. These models, completed in FY91, provide a cartographic base to which all existing Mars data can be registered.

The digital image map of Mars is a cartographic extension of a set of CD-ROM volumes containing individual Viking Orbiter images (USA_NASA_PDS_VO_1001 through VO_1008) now being released. The data in these volumes are pristine in the sense that they were processed only to the extent required to view them as images. They contain the artifacts and the radiometric, geometric, and photometric characteristics of the raw data transmitted by the spacecraft. This new set of volumes, on the other hand, contains cartographic compilations made by processing the raw images to reduce radiometric and geometric distortions and to form geodetically controlled MDIMs. It also contains digitized versions of an airbrushed map of Mars as well as a listing of all feature names approved by the International Astronomical Union. In addition, special geodetic and photogrammetric processing has been performed to derive rasters of topographic data, or DTMs. The latter have a format similar to that of the MDIM, except that elevation values are used in the array instead of image brightness values.

The set consists of seven volumes:

Volume 1. Vastitas Borealis Region of Mars (VO2001): MDIMs in 400 image files covering the north polar region of Mars as far south as lat 42.5° N.

Volume 2. Xanthe Terra of Mars (VO2002): MDIMs in 512 image files covering lat 47.5° N. to lat 47.5° S., long 0° to 90° W.

Volume 3. Amazonis Planitia Region of Mars (VO2003): MDIMs in 512 image files covering lat 47.5° N. to lat 47.5° S., long 90° W. to long 180° W.

Volume 4. Elysium Planitia Region of Mars (VO2004): MDIMs in 512 image files covering lat 47.5° N. to lat 47.5° S., long 180° W. to long 270° W.

Volume 5. Arabia Terra of Mars (VO2005): MDIMs in 512 image files covering lat 47.5° N. to lat 47.5° S., long 270° W. to long 0° W.

Volume 6. Planum Australe Region of Mars (VO2006): MDIMs in 400 image files covering the south polar region as far north as lat 42.5° S.

Volume 7. Digital Topographic Map of Mars (VO2007): MDIMs of the entire planet at 1/64°, 1/16°, and 1/4°/pixel, DTMs of the entire planet at 1/64°, 1/16°, and 1/4°/pixel, and the digitized airbrush map of Mars at 1/16° and 1/14°/pixel.

Each of the first six volumes contains MDIMs of the areas specified at resolutions of 1/256° (231 m)/pixel and at 1/64° (943 m)/pixel. Each volume also contains MDIM coverage and a digitized airbrush map of the entire planet at 1/16° (3.69 km)/pixel and at 1/4° (16.76 km)/pixel.

The tiling layout of the 1/64°/pixel digital models is the same on all 7 disks. Note that the 1/64°/pixel MDIM, segments of which appear in Volumes 1 through 6, is duplicated in its entirety in Volume 7. All of the resolution compressions were done by averaging, not by subsampling. A gazetteer of feature names, referenced by latitude/longitude coordinates, is included as a text file in each of the seven volumes.

REFERENCES

Batson, R.M., and Edwards, Kathleen, 1990, The Mars digital cartographic database (abs.), in Reports of the Planetary Geology and Geophysics Program--1989: National Aeronautics and Space Administration Technical Memorandum 4210, p. 567- 570.

Wu, S.S.C., Howington-Kraus, Annie, and Ablin, Karyn, 1990, Quantitative analysis of Mars' topography (abs.), in Reports of the Planetary Geology Program--1989, NASA Technical Memorandum 4210, p. 573.